

Testimony of
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before the
House Agriculture Committee
Subcommittee on General Farm Commodities and Risk Management
U. S. House of Representatives
September 29, 2005

Mr. Chairman and Members of the Committee:

I appreciate the opportunity to appear before you today to discuss recent developments in energy markets and their possible implications for the agricultural sector.

The Energy Information Administration (EIA) is the independent statistical and analytical agency in the Department of Energy. We do not promote, formulate, or take positions on policy issues, but we do produce data, analyses, and forecasts that are meant to assist policy makers, help markets function efficiently, and inform the public. Our views are strictly those of EIA and should not be construed as representing those of the Department of Energy or the Administration.

Hurricanes Katrina and Rita wrought incredible devastation on the central Gulf Coast, most importantly in terms of human suffering, but also in economic impacts that have spread well beyond the stricken area. At its peak impact, Katrina shut down over 25 percent of U.S. crude oil production, 20 percent of crude imports, 10 percent of domestic refinery capacity, and over 15 percent of U.S. natural gas production. Some of these impacts were temporary, while others will continue to affect output for many months to come.

While the effects of Hurricane Rita had not been completely assessed as of the time this testimony was prepared, we know that it resulted in a shut-in of oil and natural gas production during its passage through the Gulf of Mexico similar to that experienced for Katrina, as well as a precautionary shutdown of over 4 million barrels per day of refinery

capacity. I expect to provide more up-to-date information on Rita's aftermath in my oral testimony.

Energy Use in Farming and Farming-Related Sectors

Before turning to recent energy developments, a brief review of energy's role in the agricultural sector can help provide some of the necessary context. For 2005, EIA estimates that energy use on farms totals about 1,155 trillion British thermal units (Btu) of which: diesel accounts for 38.6 percent of total use, natural gas accounts for 18.9 percent, liquefied petroleum gas (LPG or propane) accounts for 17.2 percent, electricity accounts for 14.9 percent, gasoline accounts for 8.5, and other fuels account for 1.9 percent. In addition to direct farm use of energy, agriculture is indirectly affected by energy requirements in the fertilizer industry, specifically in nitrogenous fertilizers. The energy requirements of this industry, in terms of thermal content, are about 500 trillion Btu, of which 97.5 percent (471 billion cubic feet 2002) is natural gas, and virtually all of the remainder (3.5 billion kilowatthours) is electricity. The cost of natural gas used in the nitrogenous fertilizer industry accounts for almost half the value of its shipments.

Petroleum

Even before Hurricane Katrina struck on August 29th, crude oil and petroleum product prices were setting records. On August 26, the near-month price of crude oil on the New York Mercantile Exchange closed at over \$66 per barrel, which was \$23 per barrel, or more than 50 percent, higher than a year earlier. Over the same one-year period, retail gasoline and diesel fuel prices had risen 74 cents and 72 cents per gallon, respectively. Oil prices worldwide had been rising steadily since 2002, due in large part to growth in

global demand, which has used up much of the world's surplus production capacity.

Refineries have been running at increasingly high levels of utilization in many parts of the world, including the United States.

Many of the facilities shut in by Hurricane Katrina have since restarted. As of September 19, before precautionary shut-ins of production and refinery capacity began in anticipation of Hurricane Rita, about 838 thousand barrels per day of crude oil production remained offline, along with four major refineries with a total distillation capacity of 880 thousand barrels per day.

In the immediate aftermath of Hurricane Katrina, with the extent of actual damage then largely unknown, crude oil prices rose briefly over \$70 per barrel, up more than \$4 in less than 48 hours, but in less than a week had fallen below their pre-storm levels. The impact on crude oil prices was undoubtedly lessened by the relatively robust inventory levels before the storm and by the quick assurance that refiners unable to obtain adequate crude oil supplies would be able to borrow by way of time exchanges from the Strategic Petroleum Reserve, even before the coordinated release of stocks by the United States and other members of the International Energy Agency was announced on September 2.

The more significant price impact, however, was on finished petroleum products. Spot prices (the level at which large volumes are sold by refiners, importers, and traders) for gasoline rose as much as \$1.40 per gallon east of the Rockies within 3 days, while spot diesel fuel prices rose 35 to 40 cents.

The seemingly disproportionate change in finished product prices reflects the severity and expected persistence of Hurricane Katrina's impact on refining operations in the

Gulf. Additionally, the shutdown of the Capline, a major crude oil pipeline from Louisiana to the Midwest, reduced crude supplies to refineries there, causing several to temporarily reduce operations. Finally, the temporary closure of the Colonial and Plantation product pipelines in the aftermath of Katrina virtually halted distribution of products from the Gulf Coast to the lower East Coast, as far north as Baltimore. This led to some temporary product shortages, particularly in the South Atlantic region of the country, in the days immediately following the hurricane.

As U.S. refineries operate increasingly close to full capacity, and product demand continues to rise, the balance of demand must be served with product imports. This, in turn, requires a sufficient price differential between the United States and other world markets to attract the needed imports. Although this differential does not increase the **cost** of refining products in the United States, it does tend to increase the **market value** of finished petroleum products relative to crude oil. And this typically affects all products in the market, regardless of their specific origin.

Wholesale petroleum product prices, like those of crude oil, have fallen back from their peak levels. Similarly, the U.S. average retail gasoline price has dropped by 28 cents per gallon in the past 2 weeks and, as of Monday, September 16, was about 19 cents higher than its pre-hurricane level.

While the near-term outlook for oil markets depends on a number of factors, the rate at which refinery capacity affected by Katrina (and possibly by Rita) can be brought back on-line is the major factor affecting petroleum product markets. Current estimates

indicate that some of the refineries shut down by Katrina may not be fully available for months.

Even if the energy system is fully or near fully restored by December, prices for all petroleum products are likely to remain elevated. On September 7, we released our monthly *Short-Term Energy Outlook*. For this *Outlook*, we considered three cases based on the speed of recovery of the energy system from the effects of Hurricane Katrina—Slow, Medium, and Fast Recovery cases.

In the Medium Recovery case, we project an average price for refiner sales of low-sulfur diesel fuel of roughly \$2.12 per gallon in September, up about 22 cents from the August level, which declines to about \$2.01 per gallon by December. This September price would be about 79 cents per gallon higher than the same month a year ago, while that in December would represent a year-to-year increase of about 73 cents per gallon.

In line with the impacts seen already in September, and with a significant portion of Gulf Coast refinery capacity expected to remain off-line well into the fourth quarter, EIA's *Short-Term Energy Outlook* also reflects our expectation for lower refinery production and lower inventories for the remainder of 2005.

Natural Gas

Like petroleum and petroleum products, even before Hurricane Katrina struck on August 29, natural gas prices were setting records. On August 26, the near-month price (Henry Hub) of natural gas on the New York Mercantile Exchange closed at \$9.80 per million Btu, which was \$4.60 per million Btu higher than a year earlier.

At its peak, Hurricane Katrina shut in 8.8 trillion cubic feet of natural gas, roughly 85 percent of total Federal Gulf of Mexico natural gas production. Many of the facilities shut in by Katrina had restarted as of September 19, before Hurricane Rita shut-ins began near the Texas coast; about 3.4 trillion cubic feet of natural gas remained shut-in (about 33 percent of total Gulf of Mexico production).

In our Medium Recovery case, we expect the Henry Hub natural gas spot price to average \$8.82 per thousand cubic feet (mcf) in 2005 and \$8.42 per mcf in 2006. Depending on the speed of recovery from the supply losses in the Gulf of Mexico due to Katrina, the average price across the three recovery cases for the fourth quarter of 2005 ranges from \$11 to \$13 per mcf.

On an annual basis, the range in the spot price of natural gas is around \$8.75 per mcf to \$9.14 per mcf in 2005. In August, the Henry Hub natural gas spot price averaged over \$9 per mcf, as hot weather in the East and Southwest increased natural gas-fired electricity generation for cooling demand and crude oil prices increased. The natural gas market is likely to stay tight over the next couple of months, particularly in light of the supply impacts from Katrina. Spot prices are expected to ease going into 2006 as the effects of Katrina fade. However, prices at the Henry Hub are likely to remain above \$10 per mcf until peak winter demand is over.

Depending on the region of the country, increases for 2005 natural gas spot prices are expected to range between 37 and 50 percent above the 2004 averages under the Medium Recovery case. Citygate prices (prices that natural gas utilities pay at the point where they take delivery) and end-use prices (prices charged by utilities for natural gas

delivered to end-use customers, including distribution or other charges not included in the utilities' natural gas costs) are expected to exhibit double-digit percent increases for the second year in a row in most regions. For the upcoming winter, pressure on delivered natural gas prices may be sharpest in regions where heating demands are likely to increase the most, such as in the central portion of the United States.

According to our September 22 Weekly Natural Gas Storage Report for the week ending Friday, September 16, working gas in storage increased to 2,832 billion cubic feet (bcf), which is 92 bcf, or 3.4 percent, above the 5-year average inventory level. The implied net addition of 74 bcf is nearly 8 percent below the 5-year average net injection of 80 bcf but about 3 percent above the net injection of 72 bcf during the report week last year. This marks a return to the pattern of below-average injections that has persisted for 11 out of the last 12 weeks. However, this is the first time since June 24, 2005, that the net change exceeded last year's levels. Katrina is likely to reduce the peak storage achievable over the remainder of the injection season.

Domestic natural gas production in 2005 is expected to drop by at least 1.5 percent due mainly to the major disruptions to infrastructure in the Gulf of Mexico from the recent hurricanes. Preliminary EIA data through June yield an apparent decrease in output of 1.5 percent for the first half of 2005 compared to the same period in 2004, as recovery from the disruption caused by Hurricane Ivan in late 2004 was not yet complete.

Meanwhile, imports of liquefied natural gas (LNG) into the United States appear to have exhibited minimal year-over-year increases (on average) through the first half of 2005. Currently, total LNG imports for 2005 are expected to be approximately 710 bcf compared to 650 bcf in 2004.

Natural gas demand is projected to fall by 0.7 percent in 2005, but recover by 2.4 percent in 2006 due to an assumed return to normal weather and continued strength in consumption for electric power production.

Ethanol

While higher petroleum product prices are naturally viewed as a negative development by most energy consumers, it should be noted in the context of this hearing that higher petroleum product prices can also serve to improve the competitiveness of ethanol as a vehicle fuel.

EIA recently conducted a study on the near- and mid-term potential price and supply effects of enacting legislation mandating the use of renewable fuels. Our study considered provisions similar to those that were ultimately included in the recently-enacted Energy Policy Act of 2005. The estimated impacts of such provisions were shown to be highly sensitive to the assumptions regarding the future path of world oil prices relative to the costs of ethanol. For example, the base case for that analysis projected growth in ethanol consumption from 3.4 billion gallons in 2004 to 5.7 billion gallons in 2012, because corn ethanol with the 51-cent per gallon Federal tax credit was competitive with gasoline. Under a lower world oil price scenario, ethanol was found to be significantly less competitive absent a renewable fuels mandate, with consumption reaching only 4.5 billion gallons by 2025. Conversely, a higher world oil price scenario could stimulate even more renewable fuels consumption than is mandated by the recently

enacted legislation. This issue will be bear close attention as new oil price scenarios are developed for the *Annual Energy Outlook 2006*, scheduled for release in November 2005.

Energy Expenditures

Dramatic increases in domestic energy costs, assisted by everything from tight world oil markets, to extreme summer heat, to the ravages of Hurricane Katrina, have made for an exasperating summer for many consumers and have set the stage for a potentially expensive winter heating season. Current data and projections from our September *Short Term Energy Outlook* indicate that aggregate domestic expenditures for key energy sources for the summer (April through September) are expected to show the following changes from 2004: petroleum, up 35 percent; natural gas, up 20 percent, and electricity, up 5 percent.

The outlook for the upcoming winter heating season (October 2005 through March 2006) yields expectations for energy expenditures as follows: petroleum, up 34 percent; natural gas, up 52 percent; and electricity, up 11 percent. For all of 2005, energy expenditures in the United States are expected to be \$1.08 trillion, approximately 24 percent above the 2004 level. This level of expenditures represents approximately 8.7 percent of annual gross domestic product, compared to 6.2 percent as recently as 2002, and is the highest percentage since 1985, when it was 10.4 percent.

With the full impact on near-term domestic oil and natural gas supply of recent hurricanes is still being assessed, the fuel price outlook for the upcoming winter remains particularly uncertain for now. Assuming that the Medium Recovery case from the September *Outlook* holds, the general expectation for increases in residential per-

household expenditures for fuels this winter generally shapes up as follows: up 71 percent for natural gas in the Midwest, up 17 percent for electricity in the South, up 31 percent for heating oil in the Northeast, and up 40 percent for propane in the Midwest relative to last winter. Expenditure increases for natural gas are expected to be particularly strong in the East North Central region (Ohio, Indiana, Illinois, Michigan, and Wisconsin) because of expected higher heating-related demand in comparison to the relatively mild conditions seen last year. The October edition of the of the *Short Term Energy Outlook*, which will reflect our updated understanding of the impacts of Hurricanes Katrina and Rita and also include an expanded *Winter Fuels Outlook*, will be released on October 12.

Impact of Energy Price Changes on Farm Costs

Using the previous information about energy use on farms and in closely-related sectors, every additional dime added to the price of gasoline and diesel oil, sustained over a year, costs U.S. agriculture almost \$400 million annually. Every dollar added to the price per thousand cubic feet of natural gas costs agriculture over \$200 million annually in direct expense and costs the nitrogenous fertilizer industry almost \$500 million annually. Every dime increase in the price of liquefied petroleum gas (propane) costs agriculture over \$200 million per year. Every penny increase in the price per-kilowatthour of purchased electricity costs agriculture about \$500 million annually in direct expense and costs the nitrogenous fertilizer industry about \$35 million.

This concludes my statement, Mr. Chairman, and I will be happy to answer any questions you and the other Members may have.